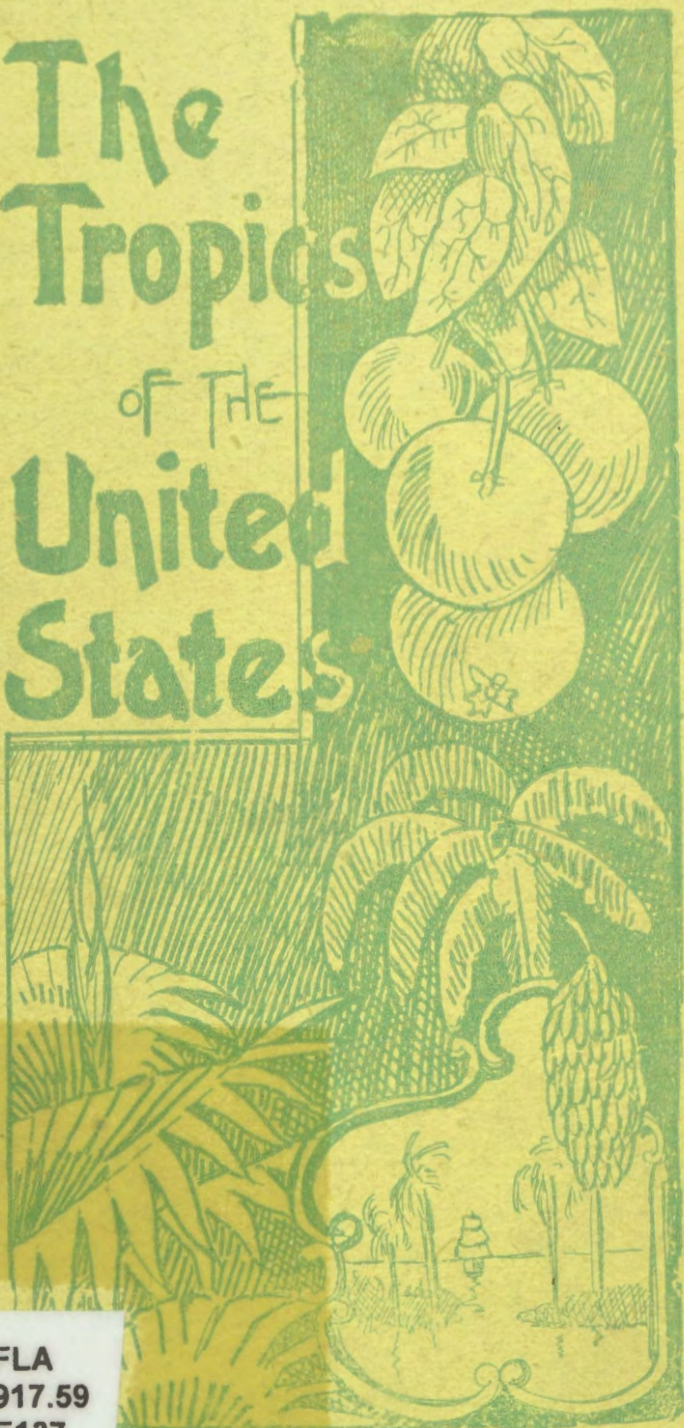


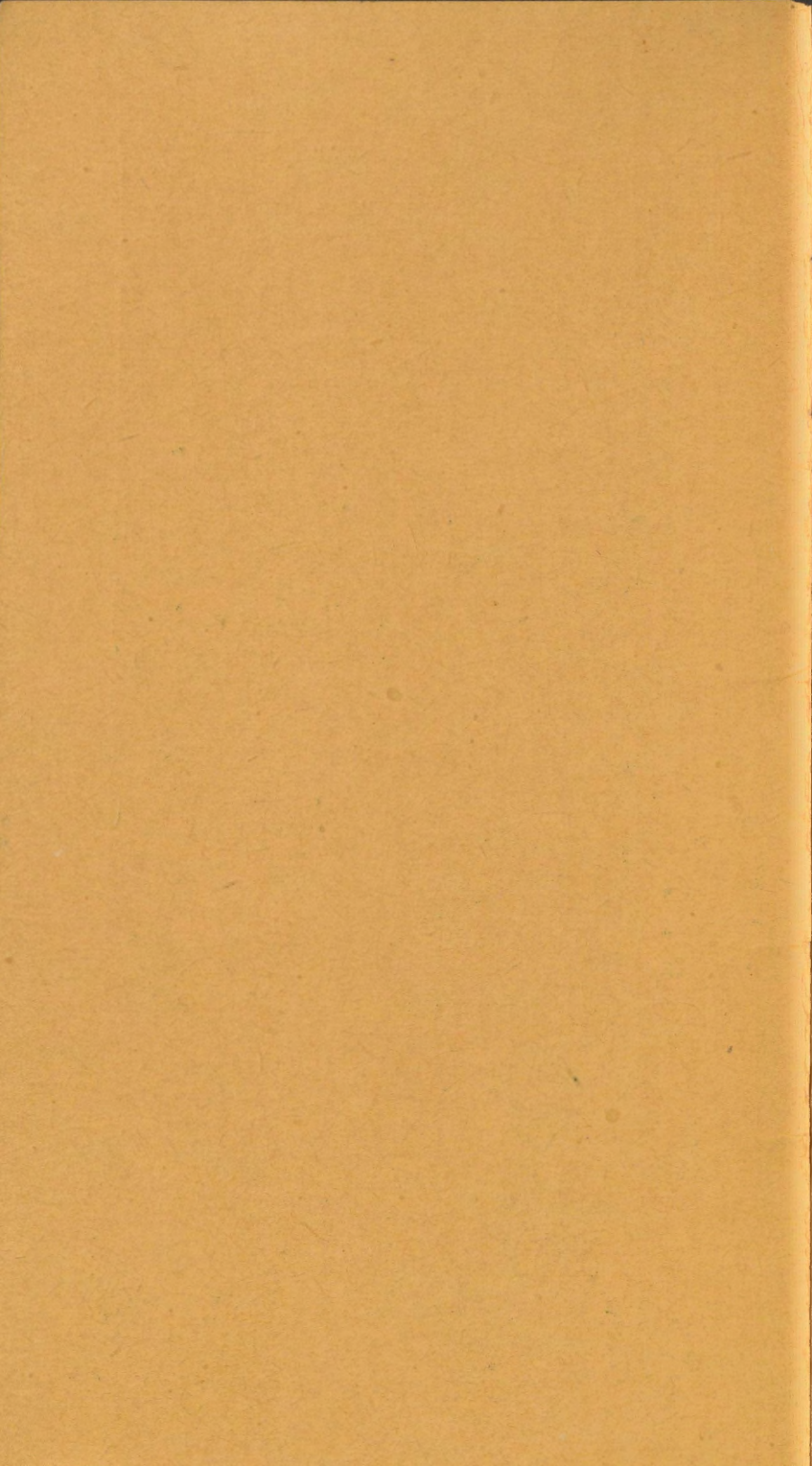
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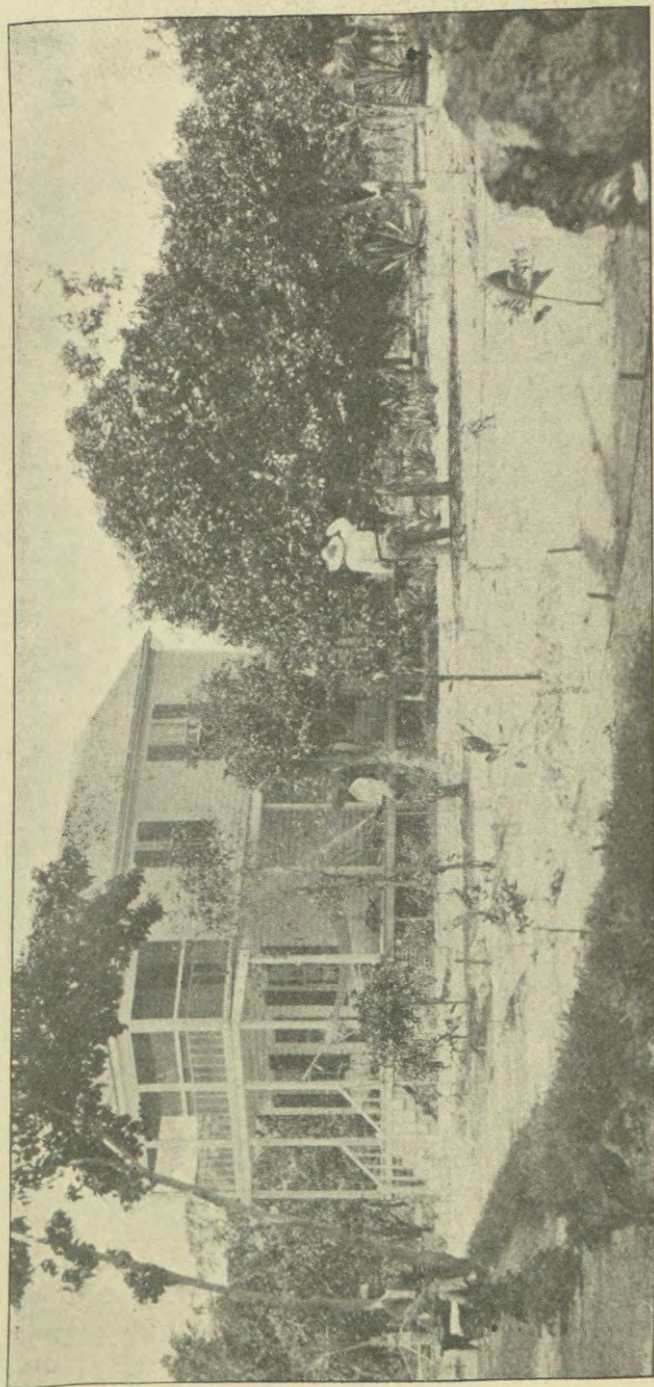


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HOME AND ORANGE GROVE OF H. L. HUFFMAN, BUENA VISTA, FLA., ON BISCAYNE BAY.

THE TROPICS

OF THE
UNITED STATES.

THE HOME OF THE ORANGE, LIME
AND ALL CITRUS FRUITS.

EXPERIENCE OF PRACTICAL ORANGE
GROWERS IN SOUTH BREVARD
AND DADE COUNTIES.

READ THEIR TESTIMONY.
IT IS
SOUND, LOGICAL AND CONVINCING.

LAND DEPARTMENT,
FLORIDA EAST COAST RAILWAY.

J. E. INGRAHAM,

THIRD VICE-PRESIDENT,

ST. AUGUSTINE, FLA.

JACKSONVILLE, FLA.
THE H. & W. B. DREW COMPANY.
1899.

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INTRODUCTORY.

THERE is no branch of horticulture that brings the planter larger returns on the money invested than that of growing citrus fruits, when carried on intelligently and under favorable conditions.

That section of Florida once known as the "orange belt" was the most prosperous fruit section of the United States. The successive frosts that have visited that territory have, in many instances, almost wiped out the orange industry. Little was comparatively known of the lower East Coast of Florida (the tropics of the United States) until the extension of the Florida East Coast Railway to Miami. The extension of this trunk line of railroad has opened for settlement the most wonderful country in the United States, with a climate superior to that of any other section, having a soil well adapted to growing citrus fruits to perfection.

The lands are divided into three classes, viz: Hammock, pine and prairie.

The hammock lands bear unmistakable evidence of the adaptability of the soil and climate for growing citrus fruits. This class of land is covered with a dense growth of tropical forest, consisting of gum-bo-lim-bor-mastic, live oak, redwood, lime, lemon, orange, etc.

Frosts of sufficient severity to injure any of these tropical trees have never vis-

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ited this section. Many of these tropical forest trees are far more susceptible to injury from frosts than any of the citrus family.

The pine lands have proven to be equally as well adapted for successfully growing citrus fruits as the hammocks.

We take great pleasure in presenting to the readers of this little pamphlet several letters written by well-known and experienced orange growers, giving their experience in growing citrus fruits in this tropical section; also their opinions, based upon actual experience and observation of the future of the citrus industry throughout the lower East Coast:

COCOANUT GROVE, FLA., June 20, 1899.

Mr. James E. Ingraham.

DEAR SIR: In reply to your request for information regarding the growing of citrus fruits in Dade County, Florida, I would say that, after twelve years of experimenting with orange trees, I am convinced that this section of country is preëminently adapted, both by soil and climate, to that culture.

While the soil of the northern half of our county is light and deep—in other words “sandy”—and in this respect resembles that of what was formerly the orange belt of Florida *par excellence*, the soil of the southern half is incredibly

rocky, and at first sight presents a most unpromising appearance.

But that very characteristic gives it an advantage over the unmixed sands of other sections, since not only does our rock, which is old coral, contains in itself elements of fertility, but, being porous, it retains moisture, while allowing a ready drainage to superfluous rainfall. The surface rocks, in most cases loose and readily removed, make neat and durable fences for the grove; while that which underlies is honeycombed with potholes and crevices, containing ancient marine matter, on which rootlets of all kinds feed greedily.

Some of the heaviest hammock growths of this section cover the baldest rocky reefs; and, while I would not advise the planting of groves on these reefs, since there is any amount of better land to be had, I have proved by experiment that they will support orange trees, and I can show a number, thrifty, dark green and laden with fruit, growing apparently in solid rock. The tree of which I send you a photograph stands on a ledge of rock, and has no soil about it except what I have put there in the shape of decomposed seaweed. As a rule, trees grown on these reefs or ridges of rock do not attain the size of those planted in more favorable localities, but they bear freely, and

yield a thin-skinned, juicy fruit of superior flavor.

The reefs, to which I have thus drawn your attention because my own experiments have been largely conducted on one of them, have a general trend parallel to that of the coast, and between them lie broad depressions of soil, holding so little surface rock that they may readily be plowed, but having the desirable underlying coral formation. This soil is rich in lime and ammonia, but lacks potash and nitrogen, which must, of course, be supplied. In other words, it is as necessary to fertilize groves here as elsewhere.

For the growing of oranges the climate of this section leaves little or nothing to be desired. Since I came here to live in 1885, we have seen frost on three occasions—in 1886, 1895 and 1899. The last was the most severe of the three; but, though my trees were full of bloom and young growth at the time, not a blossom fell, nor was the tenderest shoot frost-bitten. It did not get cold enough—nor do I believe it ever will—to effect the slightest injury to trees of the citrus family.

Our heaviest rainfall occurs during July, August and September, but there is no month throughout the year without more or less rain. Summer heats, tempered by sea breezes, are never so severe here as in the North, 92 degrees being the

maximum, and 85 degrees the normal daytime temperatures from June to October, with cool nights *always*; while the normal winter temperature is 73 degrees, dropping to 60 degrees at night.

In planting groves the general desire is to set the trees in straight, parallel lines, both for appearance and because they are thus easier to irrigate; but in south Dade this pleasing regularity is often interrupted by outcropping ledges of rock. Some growers, rather than break the uniformity of their rows, excavate holes in these ledges with dynamite. This, however, is a practice that I can not endorse; because our rock, being soft, is not shattered or cracked by the force of the explosion. It is merely scooped out from a bowl-like depression, the sides of which are densely compacted. The roots of a tree, planted in such a hole, fill it and turn back on themselves until they form a close mat. It is as though the young plant were set in a flower-pot, from which its roots can not escape. My practice, therefore, is to sacrifice linear regularity, and to set trees only in natural holes, such as can always be found by prospecting for them, and which generally offer lateral avenues through which the roots may find their way. In these holes, too, is always moisture, brought up from the underlying water, which, flowing from the Everglades to the sea, can be found in un-

limited quantities at a depth of from ten to twenty feet below the surface.

On account of the universal substratum of rock, which limits the growth of taproots, the best citrus stock for this country is rough lemon or lime, both of which grow luxuriantly here, as if indigenous to the soil. These are surface feeders, and adapt themselves so admirably to prevailing conditions that I have both lemon and lime trees, sprung from volunteer seed, allowed to exist without cultivation or fertilizing, yet growing rankly and bearing fruit year after year without signs of failure.

The tree of which I send a photograph was one of these rough lemons converted into an orange by budding in April, 1897, when eight years old. It was budded four and five feet from the ground, in six or seven different limbs. This photograph was taken exactly two years from the date of budding, when the tree was laden with over one hundred oranges, fourteen of which grew in a cluster so heavy that it had to be propped. At the present date of writing the tree is carrying a fine second crop of oranges, about the size of golf balls.

While most of my trees are yet so young that only a few show fruit, I have some in their sixth year of bearing. None of these exhibit signs of dieback nor of a diminution of fruitage. The oranges they

yield are full of juice, and have the fine flavor of those grown on the Indian River. Nearly all of them are "russets," because I have never sprayed them for rust. Even though I had, I could not have produced the "brights" of a higher latitude; for, as the ripe oranges of the tropics are generally of a rusty green, so ours of this semitropical locality seldom attain the rich golden yellow that distinguishes the product of groves located within the isothermal belt of killing frosts. But, while Dade County may not produce as "pretty" oranges as some other regions, it can yield an assured crop, year after year, of as large, fine-flavored and juicy fruit as ever was eaten, and that without the expense of banking or otherwise protecting the trees against frost.

Pomelos (grapefruit), lemons and limes grow here equally well with oranges, and much attention is at present being paid to the first named. Limes grow like weeds, and with as little care. Heretofore the demand for them has been so light that they have been allowed to drop to the ground untouched; but now they are being gathered and shipped to supply an ever-increasing trade all over the Southern States.

Besides citrus fruits are three others to which our rocky soil seems peculiarly adapted, and which may be raised with little trouble to meet an ever-growing

demand. I refer to the guava, avocado (alligator) pear and the mango.

The first named is a rank grower, springing up on all sides wherever seeds have been dropped, and is a prolific bearer. So far as I have been able to determine, it is unmolested by disease or insect, and its fruit is in demand, far in excess of the supply, at \$1.00 per bushel, cash, from local jelly factories.

Both the avocado pear and mango, at present little appreciated in Northern markets, command fancy prices wherever known, and find a congenial home in the southern part of Dade County, where they flourish without restraint or backset.

Firmly believing, as I do, that this is the most favored section of the United States for the fruits I have named, and hoping I have succeeded in conveying the information you desired,

I remain, very truly yours,

KIRK MUNROE.

ANKONA, FLA., June 14, 1899.

*Mr. J. E. Ingraham, Third Vice-President
Florida East Coast Railway, St. Augustine, Fla.*

DEAR SIR: The subject of the cultivation of citrus fruits has become of such general interest that I take pleasure in adding my unit to the general fund of information which the public is seeking.

For several years the writer has believed that in Florida, as elsewhere, the greatest success and safety was along the line of greater diversity. This belief has developed into a certainty in the last four years. Since the cold wave of February last there has been a decided tendency to move down the coast in quest of a location where the citrus fruits could be grown on terms of perfect safety. Our experience, study and observation for a period of ten years, during which the most destructive cold waves in the history of Florida have occurred, have satisfied the observant beyond doubt that on the East Coast, south of the Sebastian River, the conditions were eminently safe and satisfactory. I propose to write of the country between the Sebastian River and the St. Lucie River, along the line of the Florida East Coast Railway, and covering a distance of from forty to forty-five miles, in the extreme southern part of Brevard County. This territorial limitation is because of greater familiarity with that field, having grown oranges and other citrus fruits in it for ten years, and because it has some local conditions.

THE LAND.

In this territory the land suited to orange growing can be said to be divisible into two classes: Heavy, rich, low, hardwood hammock, and hickory ridges, with

yellow soil coming to the surface. This latter grade of land is elevated eight to ten feet above the Indian River, and in it is included some of our best orange land. Ample experience has demonstrated this. Many of the old-time orange growers from the interior of the State believe that the low hammock land, on account of its greater moisture and fertility, will be the most economical to operate on. Large experience in the interior approves of this grade of land. The difference between here and farther north is wholly a question of *climate*. We have the *climate* as well as the soil.

In township 34, range 40, can be found good bodies of both these lands, conceded by experts to be thoroughly adapted, both as to soil and climate, for orange growing. In all of the territory named more or less good orange land can be found.

THE CLIMATE.

It is useless to quote temperatures. It is better to state the results of the three heaviest cold waves known to this generation, namely, December, 1894, February, 1895, and February, 1899, at all of which times the orange business was practically wiped out in northern Florida. In the territory of which I am writing the trees were in full fruit, and at the February freezes in full bloom. Not a leaf was touched nor a bloom injured, and the

fruit hung uninjured on the trees. So far as orange and grapefruit trees were concerned, there was no evidence of the cold waves. These are the severest tests to which one can put the business. It settled in our minds that for the safety of the citrus fruits we need have no fears.

WIND PROTECTION.

Good wind-breaks are very essential to the safety of orange trees anywhere on this coast. There is greater exposure to wind than in the interior. The natural forest makes the best wind-break, and enough of it should be left on all sides of the grove to meet all emergencies in this line. While the northwest and north winds are dreaded most, our experience is that the spring winds from the south and southwest are equally to be provided against. Every dweller on the coast knows that the fall northeast to east trade winds are full of vigor, not to mention the gales that do not come oftener than once in a decade.

All this points out the path of safety to be *good wind-breaks on all sides of your grove*. The question of what constitutes a sufficient wind-break depends upon the timber and the lay of the land. In some places twenty-five to fifty feet left untouched would be ample; in others it might need sixty to seventy-five feet. Good judgment will settle this question,

and if you err be sure it is on the side of plenty.

Some planters, because they are fortunate enough to escape for a few years, underestimate the value of wind protection. It will be only a matter of time when the necessity will be fully pressed upon them.

PREPARATION OF THE LAND.

There are several methods, all of which have their advantages. Much depends on the means of the planter. In the end the most economic method is to grub and clear the land thoroughly, leaving possibly some cabbage-palmetto trees for shade and overhanging protection. Some also leave an occasional oak or hickory while the grove is young, believing that the partial shade helps to conserve the moisture and otherwise protect the young trees from the sun's rays. After all, it is a question to be decided by the nature of the growth on the land. The leaf mold and humus should be saved as much as possible, since it gradually decays and builds up the fertility of the soil, besides serving a temporary purpose, as mulching.

Where there are spruce pine or long-leaf pine trees I have found it best to cut them down at the outset. The boughs we usually burn, together with the other underbrush which is too bulky and cumber-

some to leave either in piles or windrows. This makes a light fire, and is not so injurious as the burning of the heavy limbs and tree trunks. These can often be piled out of the way without much labor or expense. Roots, leaf mold and small trash and rakings we pile up between the trees in the rows and let it rot. It disappears in a few years. The cost of putting land in shape for planting, if all done at one operation, varies with the character of the land from \$40 to \$75 per acre.

Some people cut down the brush trees, etc., and, after burning the brush, grub strips eight to ten feet wide and set the trees in this strip, and about a year from that time grub out the centers. This reduces the first cost, but the ultimate cost is about the same.

It is possible by the latter method to save more of the material on the ground, and save the cultivation of a part of the ground during the first year. It also divides the expense where this is desirable. It will be understood that the roots of a young orange tree would not extend more than two and one-half to three feet from the trunk during the first year, but spreads out rapidly after that. If the strip method is adopted the centers should be grubbed before the roots extend beyond the original strips. After the first year the roots are larger than one expects to find them.

Beyond these general suggestions the new comer will be expected to use good judgment, and see how his successful neighbor does the same work. Nowhere does *experience* count for more than in Florida.

DISTANCES.

The tendency of the past few years has been to less distance than formerly. In the interior, before the freezes, they planted orange trees all the way from 25 to 40 feet apart. On this coast, fifteen years ago, 20 to 25 feet was considered about right. It came to be generally practiced at 100 trees to the acre, which is about 21 feet apart, in squares. During the past two years I have planted for myself and others nearly 5,000 orange and grapefruit trees. I have planted some 15 by 15 feet, in squares; some 15 by 18 feet, and some 18 by 20 feet. This has been on different grades of land, and I have kept in mind the tendency to more rapid growth on low, rich hammock, and the ultimate production of a large tree. I, therefore, give more room on this grade of land. There are certain good reasons for reasonably close planting, but it must not be carried too far. Close planting tends to produce a low-headed, spready, dense tree. It shades its own roots and trunk early, and is not so exposed to wind, and is easier and cheaper to gather fruit from.

It is believed by many that in the first ten years one will get more fruit from 125 trees to the acre than from eighty; after that time the tops *may* be a little close. On a good grade of land 18 by 20, or 20 by 20 feet, is probably a safe distance. There is much divergance of opinion and experience on this matter by equally competent and intelligent growers. It is undoubtedly true that for every thousand trees planted on eight acres of land rather than on twelve to fifteen acres, as was formerly done in the interior, you can do much more in the way of care and fertilizer, since the reduced area makes intensive culture possible. Intensive culture usually pays.

Where the land is suited to both oranges and pineapples, which is the case with the yellow-soil, hickory ridges, some growers plant four to five rows of pineapples in the strips between the tree rows. By setting 15 by 20 inches this only takes up forty-five to sixty inches of space out of eighteen or twenty feet.

This method has the advantage of better cultivation, more fertilizer and a more rapid revenue. I would only take two or three crops of pines off the land, since after that the pines would crowd the trees too much.

While I am not recommending this method, I have tried it successfully, and others are trying it. It will take two or

three years yet before we are sure of it. However, if there is a conflict between the trees and the pineapples, we can choose between them. In trying this method care should be taken not to fertilize the pines with anything likely to conflict with the welfare of the orange trees. Anyone with experience and observation will not make this mistake.

VARIETIES.

The catalogues of our leading nurserymen can be safely consulted on this point. I believe that early, medium and late varieties should be grown for the purpose of covering a longer season, and that a large number of varieties has no advantage. I would rather divide a thousand trees into four classes than into ten. On this coast there is grown a variety that is world-famous—the Indian River orange. There is not anything better.

PLANTING.

The best time to plant is from December 1st to February 1st, with preference for December. Early planting is best on many accounts. An orange tree will live at almost any season, but the chances are not so good, and the labor and care much greater.

At time of transplanting the tops should be well cut back, and the leaves clipped off without breaking them from the trunk. Under ordinary circumstances

medium-sized buds will start better than the large ones. In this windy latitude trees should be cut and trained low. This prevents whipping by wind, protects the trunk and ground from hot sun, and makes gathering of the fruit easier and cheaper.

Oranges should be carefully set, the roots well protected when being moved, and carefully spread when planted. Care should be taken not to set too deep. The collar or base of the large roots should be slightly above the general level of the ground.

Experience has shown this to be quite essential. One of our leading nurserymen has given the following concise directions for planting. I give it in his own language:

“In planting, two men should work together, one of whom should hold the tree in a perpendicular position, while the other spreads out the roots in the natural position, and packs the finest and best pulverized earth obtainable in close contact with every root and fibre. This should be done with the hands. Have the man who performs this part of the work do it thoroughly. When finished, the earth about the roots should be firm and solid. Be careful not to set too deep; make allowance for the trees settling a little; remember that nearly all trees do better with the base of their crown roots at or near the surface; orange trees in

particular must receive careful attention in this respect; their collar should be above the surface.

“After having packed the earth around the roots with the hands, pull up a small circle of earth (saucer-shaped, with the tree in the center), and pour in a pail of water; after the water has had time to settle away, see if there are any vacant spaces under and around the crown roots near the trunk; if so, pack them full of fine earth with the hands; then pull on more earth and pack with the feet. After this is done, place around the tree some sods, wiregrass, pine straw, or something to act as a mulch and prevent the surface from baking. When set in the above described manner, the ground will keep in a moist and friable condition, and the trees will hardly need any subsequent watering. *Remember that if they are to be watered, one thorough drenching is worth more than a dozen small applications.*”

FERTILIZING.

The character of the land and its degree of natural fertility must always determine the amount of fertilizing needful.

For the first few years *growth* is the thing to be sought, leaving questions of fruit for a later time. A few handful of ashes, bone meal or well-rotted compost, spaded into the ground before the tree is

set, will aid it in getting established, but the greater part of the fertilizing must be done along with the cultivation, and be distributed and timed as to seasons and other natural conditions. Nothing will give such quick results in the way of fertilizing as some of the well-tested commercial fertilizers, which are rich in ammonia and phosphoric acid. Any well-known and thoroughly-tested so-called "complete" fertilizer will promote an early and vigorous tree growth. A pound of this to the tree, evenly scattered over the surface of the ground for a distance of three feet from the stem in every direction and raked in well, will soon be recognized by the tree. In fact, if all trees received a sufficient quantity at the right time, there would be comparatively few which would not give satisfactory results. The first application to these newly set trees having been made, say in March, a second one of about the same amount in July will prove advantageous. All kinds of trees are greatly benefited by the use of bone meal, ashes and cotton-seed meal. Remember, however, that if cotton seed or cotton-seed meal is used, that it has to undergo a rotting process in the ground before becoming available as plant food, and that it should never be placed in direct contact with the roots. Well rotted manure and composts are always good for fruit trees, and should be plowed in shal-

low and then covered with mulching. Potash is more essentially a *fruit* fertilizer, and the quantity of it used should be increased with the age of the tree.

For young trees the Mapes orange-tree fertilizer, used according to their directions, can not be excelled.

MULCHING.

It has been the practice on the lower East Coast to mulch heavily with leaf mold or the rakings of the land after planting. This was designed for the double purpose of shading the ground and preventing the evaporation of the moisture and getting the benefit of the humus as the material decays.

This mulching should be removed and the land stirred at intervals of not exceeding six months. This moving gradually breaks up the material and incorporates it with the soil. Mulching has a tendency to bring the feeding roots of the tree to the surface for obvious reasons; hence the need of frequent removal and stirring of the ground to keep the roots deeper. After the second year great care must be exercised with reference to mulching, and good judgment used in reference to whether the land is inclined to be wet or dry. Wet land would need none, since the primary object is to conserve moisture.

CULTIVATION.

This will vary somewhat with the character of the soil. Methods vary largely, and the same methods do not always reach the same end in the different lands. We have found frequent and clean cultivation up to mid-summer, combined with the system of fertilizing before mentioned, usually succeeds. After July 15th, or a little earlier, we would cease cultivation and let the land grow up to weeds and grass, or plant cow peas on it. Let the weeds, grass or cow peas die on the ground, and then work under with plow or hoe. This method will shade the ground and also fertilize it. *Never plow under a crop of green stuff in a warm climate.*

The matter of cultivation depends wholly on the lay and nature of the land. Clean and frequent culture on high land is to be commended, but will not do for low hammock. In dry weather frequent stirring seems to prevent evaporation on high, dry land. Many of our most successful growers use only a weeding hoe, while in some localities the plow is resorted to for certain grades of land. There is such a diversity of conditions and locations that no uniform rule can be adopted. A little experience and observation will guide the grower aright on this important matter.

THE CROP.

The orange industry is now going

through an era of very high prices. It will be so for many years to come. During the past two seasons oranges netted \$4 to \$6, and in many cases much more per box. It will be very high for many years. Nothing from any other source can or does take the place of Florida oranges and grapefruit. The groves in the interior and northern part of the State are practically wiped out, and in a majority of cases will not be rebuilt. Extreme south Florida will be the citrus fruit growing region of the State. An orange grove well cared for and in good condition will put on one-half a box per tree the fourth year, and will have a few the third year from setting. The fifth year there should be an average of one box per tree, and an increase of one box per year up to the tenth year. Allowing 100 trees to the acre, it will be seen that the possibilities in orange growing are very great. In an orange grove eight to ten years old \$1,000 per acre or more has often been realized on the Indian River. Our Indian River oranges will remain at \$5 per box for several years, and will never go lower than \$2.50 to \$3 per box net to the grower.

Without undertaking to make tabular lists of the crop, I will state confidently that no crops grown in this country can compare with oranges and grapefruit grown on the Indian River under existing conditions. I am frequently asked,

"What percentage of grapefruit would you plant?" I believe 25 per cent grapefruit and 75 per cent oranges, with a few lemons, kumquats and the better grade of limes, is about right. None of us being gifted with prophetic powers, we can only reason from probabilities. There is an undoubted growth in the public taste for grapefruit; at the same time it is more the fruit of the rich or the faddists, and the markets could be much more readily oversupplied than by oranges, which are eaten by everybody. Some planters in our vicinity are putting in one-half grapefruit, but the majority are content with one-quarter. Only the future can tell whose judgment is best.

In conclusion, the writer would say that he is more than ever satisfied that south Brevard is the place for citrus fruits, and that from every standpoint of expediency and conservatism the people of that region should diversify more, and he is glad to say that they are so doing.

The orange industry, in the territory from Sebastian River southward through the county, is attracting attention, and is forging ahead in fine style. All the conditions are right and safe, and there is still a good supply of reasonably cheap land, in the best of locations, along the Florida East Coast Railway.

The writer realizes that a host of details must necessarily be omitted from a

short letter, but is always willing to answer all inquiries about lands, locations, and all topics connected with the growing of citrus fruits. While his time is too much occupied to spend it on idle inquirers, the intending settler, homeseeker or investor will be sure of full and courteous attention from as reliable and conservative a standpoint as ten years of successful experience and special study and observation can make it. The suggestion will be pardoned that stamps be enclosed to cover postage on printed matter that may be on hand for distribution. The writer has the development and welfare of the entire East Coast deeply at heart, and will gladly assist in doing his share in bringing his section of the country to the knowledge of those who may be seeking light on orange and grapefruit culture.

Very truly yours,

C. T. McCARTY,

Ankona, Fla.

*Mr. J. E. Ingraham, Third Vice-President
Florida East Coast Railway, St. Augustine, Fla.*

DEAR SIR: In response to your inquiries in regard to my experience in growing oranges and other citrus fruits, I beg to say: About nine years ago I settled on my place at Buena Vista, and there commenced my first battle with Mother

Earth. Previous to this time I had no experience whatever either in agricultural or horticultural pursuits. I found on my place a large number of citrus trees, not planted in regular grove order, but scattered about among a mass of forest and tropical fruit trees and trailing vines. After getting settled, I cleared and planted about twelve acres in choice budded lemon trees. Being anxious to make as much as possible from my investment, and by the advice of other parties, I planted pineapple slips between the rows of the lemon trees. The trees and the pineapples grew rapidly, but after a few years I found I had made a mistake. I have taken up my pines, giving the lemon trees the benefit of the entire ground.

I have used but very little commercial fertilizer, in fact not nearly the quantity that experienced orange and lemon growers have assured me that I should, neither have I given my trees the careful culture that is necessary in many sections of the State. But in spite of this the trees have made a rapid growth, are perfectly healthy, and bear good crops of fruit each year. The quality of the fruit is equal to any grown in the world. Last year I budded a portion of my lemon trees with improved varieties of oranges. The buds are making a vigorous growth, and many orange growers have assured me that they are

equal in size to buds grown in the old orange belt.

The citrus trees in my old grove, consisting of sweet seedlings, sour oranges and rough lemons, are about twenty-five years old and are perfectly healthy, and never fail bearing a full crop of fruit.

I have never fertilized these trees to any extent. They are growing on a rocky reef, within a few hundred yards of the Biscayne Bay, among a large variety of cocoanut, tropical fruit and forest trees, the orange trees receiving no more attention than the trees surrounding them. I have had many experienced orange growers from other sections tell me: "If my trees received no more care and fertilizer than yours they would not live five years."

I have unlimited faith in this section for growing citrus fruits of all classes. The lands require less fertilizer than the "sand" lands, from the fact that this whole section is underlaid with soft coralline rock that furnishes large quantities of nourishing food on which the trees thrive. Another reason why this section is pre-eminently a citrus fruit growing country is that the underlying rock is of a porous nature, through which the water percolates, giving the trees sufficient moisture even in very dry weather; and the rare combination of climate and soil makes

the Biscayne Bay country par excellent
for growing citrus and tropical fruits.

Yours, etc.,

SAMUEL FILER.

May 19th, 1899.

DANIA, FLA., June 6, 1899.

*Mr. J. E. Ingraham, Third Vice-President
Florida East Coast Railway, St. Augus-
tine, Fla.*

DEAR SIR: Your favor of the 6th
inst received, and I assure you it affords
me pleasure to comply with your request
to tell you of my experience in the culture
of citrus trees in Dade County.

I came here about three years ago,
and began a clearing in a veritable wil-
derness. Our land is what is called high
hammock, and was covered with a very
dense growth of live oak, bay, mulberry,
mastic and other trees. The grove is situ-
ated twenty-one miles north of Miami,
the county seat, on a piece of land almost
an island, in the Everglades. It consists
of fifteen acres of orange, lemon and
grapefruit trees.

When we started our grove everything
indicated that those in the then orange
belt would come out again, and thought
best to put in one-third lemons. But
since the disastrous freeze of this year in
that section conditions are changed, and
we are now budding all our lemons to

oranges. I will say right here that the cold of last winter did not injure us in the least. Trees in bloom, and many having young and tender growth, showed not a sign of being injured.

Our soil is rich in humus, and compares very favorably with the hammocks in northern Florida. Trees are planted twenty feet apart. During the winter months we grow vegetables between the rows. I am inclined to think that this method of cultivating the trees is decidedly beneficial to them, besides being the source of some revenue.

The orange grower is confronted with no more serious question than how to properly fertilize his trees. All of his success depends upon giving them just such food and in just such proportions as will make them thrifty and healthy and keep them in that condition. I have experimented with many different formulas, but those of my trees to which I have given liberal applications of complete manures are far ahead of all the others. With that treatment they certainly have made a wonderful growth and are the admiration of everyone who has seen them.

I am a firm believer in intensive fertilizing and cultivation.

We have no diseases among our trees, with the exception of an occasional one showing symptoms of dieback, as is the case on nearly all hammock lands. I find

the trees affected in that way are greatly benefitted by discontinuing the use of highly nitrogenous organic fertilizers and giving them heavy applications of high-grade sulphate of potash and phosphoric acid.

We have no troublesome insects affecting the orange trees to combat, and that seems to be the wonder of all the old growers "up the State" when they are in this section. In June the grasshoppers are a little numerous and take very kindly to the leaves, but they are easily disposed of.

One of the mistakes we made when we started was that we did not put in our system of irrigation before a tree was planted. Our orange trees should never be allowed to suffer for want of water. Especially is this true of the first year. During the spring and early summer, the time when the trees are putting on their heaviest growth, the rainfall here is not sufficient. We have a fifteen-horse-power boiler and duplex pump. The suction is four inches, delivery three and one-half, and mains three inches. The hose is two inches, with five-eighth-inch nozzle. An outfit of this kind is very inexpensive, as compared to its value in the grove.

The trees are kept mulched during the summer. We have plenty of weeds, leaves and brush to use for that purpose. Mulching supplies a shade for the roots, and as it decays, enriches the soil and furnishes

food for the trees. I am now planting cow-peas and sowing beggarweed seed over the entire grove. By using these legumes I obtain that most expensive ingredient of fertilizers—nitrogen—very cheap, besides having on hand at all times the best of material for mulching.

As to stock, I much prefer rough lemon. It is a better surface feeder than the sour orange and a taproot, extending twenty feet into the ground, is not essential to its well being. The majority of growers are of the opinion that both the orange and the grapefruit are heavier bearers on rough lemon than on any other stock.

For years we have been told that orange trees would not grow in south Florida. It was just such idle talk as this that prevented there being hundreds of acres of bearing groves in Dade County to-day. Why it was said, or why believed, I have never been able to determine. The fact remains that because credence was placed in what was said by those who had no understanding of what they were saying, the orange industry in this county is in its infancy.

My partner, Mr. A. M. Beed, now of Hampton, Iowa, but formerly of Ormond, Fla., has had twenty years' experience in the building of orange groves. He is the senior member of the well-known firm of Beed, Knox & Beed, growers of the "before-the-freeze" famous "Mound Grove" brand

of oranges. He is a man whose opinion is worthy of note. After spending a month at our place here last winter and looking over everything carefully, he said that he saw absolutely no reason why citrus trees could not be successfully grown, and that as far as his interest in this grove was concerned, felt that he had a perfectly safe investment. The best of evidence that we have unlimited confidence in its ultimate success is that we have decided to clear ten acres more and plant it in trees.

In winter the climate is perfection. The summers are hot, but the heat is not so intense and does not give one the feeling of suffocation experienced in the North, while we always have the cool ocean breeze. The nights are conducive to sleep, and every night in the year light covering is found necessary for comfort.

Yours truly,

F. J. WEST.

*Mr. J. E. Ingraham, Third Vice-President
F. E. C. Ry., St. Augustine, Fla.*

DEAR SIR: Replying to your inquiry in regard to the young orange grove owned by Mr. J. A. McDonald and myself, I will state—

Something over a year ago Mr. McDonald and myself purchased twenty acres of pine land at Orange Ridge, for the purpose of planting a citrus grove. We have now

something like twelve to fourteen acres planted in citrus trees. Neither Mr. McDonald or myself had any experience in growing orange or other trees, consequently we have been entirely dependent on others as to methods of culture, fertilization, etc. Our trees are making rapid growth, and bid fair to come to early maturity. The foliage is large and of a dark-green color, giving positive evidence of health and vigor. I visited our grove a few days since, in company with Mr. Adam Corell, formerly a successful orange grower at DeLand. He assured me that our grove was making a most satisfactory growth, and that Mr. McDonald and myself had reason to be proud of our first attempt at building an orange grove.

Mr. Corell owns a young grove near by, and he expressed himself not only satisfied but delighted with the progress his grove is making. Both Mr. McDonald and myself have great confidence in the future of the citrus-fruit industry in this section.

Truly yours,

JNO. B. REILLY.

Miami, June 23, 1899.

*Mr. J. E. Ingraham, Third Vice-President
F. E. C. Ry., St. Augustine, Fla.*

DEAR SIR: Replying to your letter of inquiry in regard to this section for growing oranges and other citrus fruit, will say :

For the last twenty or more years I have been engaged in growing citrus fruits in Clay County. The succession of freezes that came wiped out my groves there entirely. Three years since I came to the Biscayne Bay country, purchased lands, and have planted three groves; all of them are doing well, making a vigorous growth, and are perfectly healthy. In fact, I have never seen orange trees in any part of the State do better than here. I am, from experience and observation, satisfied that this is the coming orange section of the State.

Truly yours,

ARTHUR F. LANG.

Miami, June 21, 1899.

The following letter from Prof. H. E. Stockbridge, of the Florida Agricultural College, containing analysis of soils at Boca Ratone, where the large citrus groves are now being planted, speaks for itself.

FLORIDA AGRICULTURAL COLLEGE

AND EXPERIMENT STATION,

LAKE CITY, FLA., June 17, 1899.

Col. J. E. Ingraham, St. Augustine, Fla.

MY DEAR SIR: The samples of soil received from you about April 1 have been examined with the following results.

SURFACE SOIL.

Humus.....	.27 per cent.
Nitrogen0210 per cent.
Potash.....	.0182 per cent.
Phosphoric Acid0263 per cent.
Lime.....	.0731 per cent.
Reaction slightly acid.	

SUBSOIL.

Humus23 per cent.
Nitrogen0044 per cent.
Potash.....	Trace.
Phosphoric Acid0277 per cent.
Lime0124 per cent.
Reaction neutral.	

This soil, therefore, is above the average of East Coast soils in fertility, and is, I believe, well adapted to the growth of citrus trees, although, like all upland Florida soils, it requires liberal fertilization. I recommend the following minimum application of fertilizer per acre:

Acid phosphate	500 pounds.
Cotton-seed meal.....	200 pounds.
Nitrate of soda.....	150 pounds.
Muriate of potash.....	150 pounds.

These materials may all be mixed and applied together, except the nitrate of soda, which should be applied broadcast and cultivated or hoed in around the trees some weeks after the other materials are applied. This will prevent loss by leaching. The application recommended is for young growing trees. After the trees come into bearing the application should be doubled in quantity and the muriate of potash should be replaced by the same quantity of sulphate of potash. Also, the nitrate of soda might be replaced by 100 pounds of sulphate of ammonia.

Hoping the results will reach you in season for use and may not be without value, I remain,

Most truly yours,

H. E. STOCKBRIDGE.

Orange Groves at Boca Ratone.

On Saturday, June 24th, the writer visited Boca Ratone, situated about sixty miles north of Miami, on the line of the Florida East Coast Railway.

Two months ago there were little signs of life, prosperity or improvement there. The long stretch of spruce-pine lands, lying along either side of the Florida East Coast Railway, remained as it came from the hand of the Creator—an unbroken forest of delicate green. To-day Boca Ratone is the seat of gigantic enterprises, that are sending a thrill of new life and activity along the entire south portion of the lower East Coast. Three years ago Mr. Thomas M. Rickards, formerly of Candler, Fla., settled there, commencing anew the battle of life, after losing a most beautiful and profitable orange grove by the freeze of 1894-'95. Since settling at Boca Ratone Mr. Rickards has turned his attention largely to growing pineapples, experimenting in a small way with citrus fruits.

The lands at Boca Ratone are divided into three classes, viz: Hammock, muck and spruce-pine ridges and flats.

The spruce-pine lands are a light, sandy soil, with a yellow subsoil, which makes them ideal lands for growing citrus fruits.

Mr. J. E. Ingraham, third vice-presi-

dent of the Florida East Coast Railway, was instructed by Mr. Henry M. Flagler to select lands somewhere along the line of his road, for the purpose of planting a large orange grove. Mr. Ingraham made a careful inspection of the lands along the line of the railway that were suitable for orange culture, finally selecting the spruce-pine lands at this point.

After securing the lands he employed Mr. Rickards to take full management, clear the land, plant the grove, and do all work incident to carrying out his plan. Mr. Rickards has cleared, grubbed and prepared sixty acres for planting. The ground will first be sown in cow peas, beggar weed and velvet beans. The planting of the trees will be deferred until late in the fall or early winter. F. S. Lewis, a wealthy Philadelphian, and a large property holder there, has given Mr. Rickards orders to clear a forty-acre tract, east of and adjoining Mr. Flagler's. This he will plant in oranges, lemons and grapefruit.

Mr. Flagler and Mr. Lewis will erect an immense irrigating plant, and pipe their groves, thus making them entirely independent of natural rainfalls.

Mr. Lewis has a ten-acre grove, which he planted about one year ago. The grove has made a very satisfactory growth, demonstrating that these lands are adapted to growing citrus fruits. He also has two acres planted in pineapples, and it is said

to be one of the best pineries in the State. This tract is furnished with a complete steam irrigating plant.

T. Jefferson Coolridge, of Boston, Mass., has purchased a twenty-acre tract adjoining the lands of Mr. Lewis. He has instructed Mr. Rickards to proceed with the clearing, and as soon as practicable to plant in oranges, lemons and grapefruit.

Mr. G. A. Kunze, an old and experienced orange grower from Marion County, has purchased ten acres adjoining Mr. Lewis, on the west. Mr. Kunze is busy clearing the same, and will plant it in oranges and vegetables.

Lewis and Rickards have ten acres planted in pineapples, orange and grapefruit trees. Over one half they have a substantial shed. The orange and grapefruit trees have made a magnificent growth, while half their pines are in bearing.

James C. Rickards is the owner of the next place east of Lewis and Rickards. He has five acres. One acre is planted in pines, and covered.

T. M. Rickards has one acre planted in smooth cayennes. This he has shedded. Fifty per cent of his plants are now in fruit.

Louis Larson, the popular secretary of the Fort Dallas Land Company, is the owner of a choice five-acre tract, which he will improve.

J. A. Crosby, editor of the San Mateo Item, has purchased fifteen acres. He has instructed Mr. Rickards to clear, plant and cover five acres at once.

Geo. A. Long (nephew of Secretary Long, U. S. Navy), of Interlachen, formerly one of Putnam County's most successful orange growers, has purchased twenty acres. He, too, has instructed Mr. Rickards to clear, cover and plant eight acres.

Thomas Donnolly, of Interlachen, another experienced orange grower, has purchased ten acres adjoining the lands of Mr. Long, on the south. He has one acre cleared at the present writing.

Charles Frances, Jr., of the same place, is the owner of ten acres adjoining Mr. Donnolly's land on the south. Two acres have already been cleared, and Mr. Rickards has received instructions to cover and plant the same in pines and orange trees.

John S. Franz, of Tampa, Fla., a well-known traveling man, has purchased ten acres in the same tract. He will clear and plant it in grapefruit during the summer.

F. S. Lewis has recently added 220 acres to his already large holdings. A portion of this will be cleared and planted in vegetables.

The following parties have recently

purchased lands, but Mr. Rickards has received no orders to clear or plant:

D. M. Kirby, Palatka, five acres.

C. A. McLarty, Palatka, five acres.

C. E. Rowton, Palatka, five acres.

A. B. Munger, Palatka, five acres.

L. A. Corley, Palatka, five acres.

L. P. Bailey, San Mateo, ten acres.

L. P. Trull, San Mateo, ten acres.

The following parties have made application for lands:

H. S. Kealhofer, A. G. F. A., Florida East Coast Railway, ten acres.

C. S. Kenyon, Jacksonville, ten acres.

Hon. Frank Clarke, Jacksonville, ten acres.

Mr. Rickards informed us that every mail brings applications for land, and that the prospects are that all lands suitable for citrus-tree culture, in that immediate vicinity, will soon be disposed of.

There are many other substantial improvements being made. Messrs. Lewis and Rickards are grading and shelling a public avenue from the station to the canal, a distance of one mile. Shade trees will be planted on either side, making it a most charming drive. At the canal a modern boathouse will be erected. Mr. Rickards also informed us that there would be several attractive residences built late this summer. The Florida East Coast Railway has put in a long siding, with a capacity for twelve cars. The

depot and freight house will be built at an early date, and the grounds around the station tastefully laid out and planted in shrubs, flowers and trees. A residence for the foreman and a large fertilizer and ware house are now being built on Mr. Flagler's land. Mr. Rickards is very sanguine of the success of orange groves there, basing his opinion on long years of experience.

At Arch Creek the Natural Bridge Grapefruit Company is clearing lands and planting grapefruit trees. This company will plant 100 acres.

In the same locality the Southern Florida Land and Fruit Company, of Elmira, N. Y., is preparing to put in a 100-acre orange grove.

From the Sebastian River on the north to Cutler on the south there are hundreds of acres of groves being planted, and hundreds of acres of lands are being purchased for this purpose.

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